




FCC Part 18 Measurement and Test Report

For

Eggtronic Engineering SRL

Via Campagna 8, 41126, Modena - Italy

FCC ID: 2ANP7EGG170016

Test Rule(s):	<u>FCC Part 18</u>
Product Description:	<u>Triple coil embedded wireless charging system</u>
Tested Model:	<u>EGG170016</u>
Report No.:	<u>WTX19X08053138W-1</u>
Sample Receipt Date:	<u>2019-08-01</u>
Tested Date:	<u>2019-08-01 to 2019-08-14</u>
Issued Date:	<u>2019-08-14</u>
Tested By:	<u>Jason Su / Engineer</u> 
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM Test Technology Co., Ltd.

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Report version

Version No.	Date of issue	Description
Rev.00	2019-08-14	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Eggtronic Engineering SRL
Address of applicant: Via Campagna 8, 41126, Modena - Italy

Manufacturer: Eggtronic Engineering SRL
Address of manufacturer: Via Campagna 8, 41126, Modena - Italy

General Description of EUT	
Product Name:	Triple coil embedded wireless charging system
Trade Name:	Eggtronic
Model No.:	EGG170016
Adding Model(s):	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Frequency Range:	110~205kHz
Antenna Type:	Coil Antenna
Rated Voltage:	DC5V (Wireless output)
Rated Current:	1A (Wireless output)
Rated Power:	5W (Wireless output)

1.2 Test Standards

The tests were performed according to following standards:

FCC Part 18 Subpart C: Industrial, Scientific, and medical medical equipment.

ANSI C63.4-2014: American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.4 Test Facility

FCC – Registration No.: 125990

Shenzhen SEM Test Technology Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark	Power Supply Mode
TM1	Wireless Output	/	Input:DC12V for battery

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
DC Cable	0.5	Unshielded	Without Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
iPhone 8 Plus	Apple	MQ8E2CH/A	/
Battery	JIADÉ	DC12V	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	9-150kHz $\pm 3.74\text{dB}$
		0.15-30MHz $\pm 3.34\text{dB}$
Radiated Emissions	Radiated	30-200MHz $\pm 4.52\text{dB}$
		0.2-1GHz $\pm 5.56\text{dB}$
		1-6GHz $\pm 3.84\text{dB}$
		6-18GHz $\pm 3.92\text{dB}$

1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2019-04-30	2020-04-29
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2019-04-30	2020-04-29
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2019-04-30	2020-04-29
Amplifier	Agilent	8447F	3113A06717	2019-04-30	2020-04-29
Amplifier	C&D	PAP-1G18	2002	2019-04-30	2020-04-29
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2019-05-05	2021-05-04
Horn Antenna	ETS	3117	00086197	2019-05-05	2021-05-04
Loop Antenna	Schwarz beck	FMZB 1516	9773	2019-05-05	2021-05-04
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2019-04-30	2020-04-29
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2019-04-30	2020-04-29
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2019-04-30	2020-04-29

Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing

2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 18.307 (b)	Conducted Emission	N/A
§ 18.305 (b)	Radiated Emission	Compliant

N/A: Not Applicable

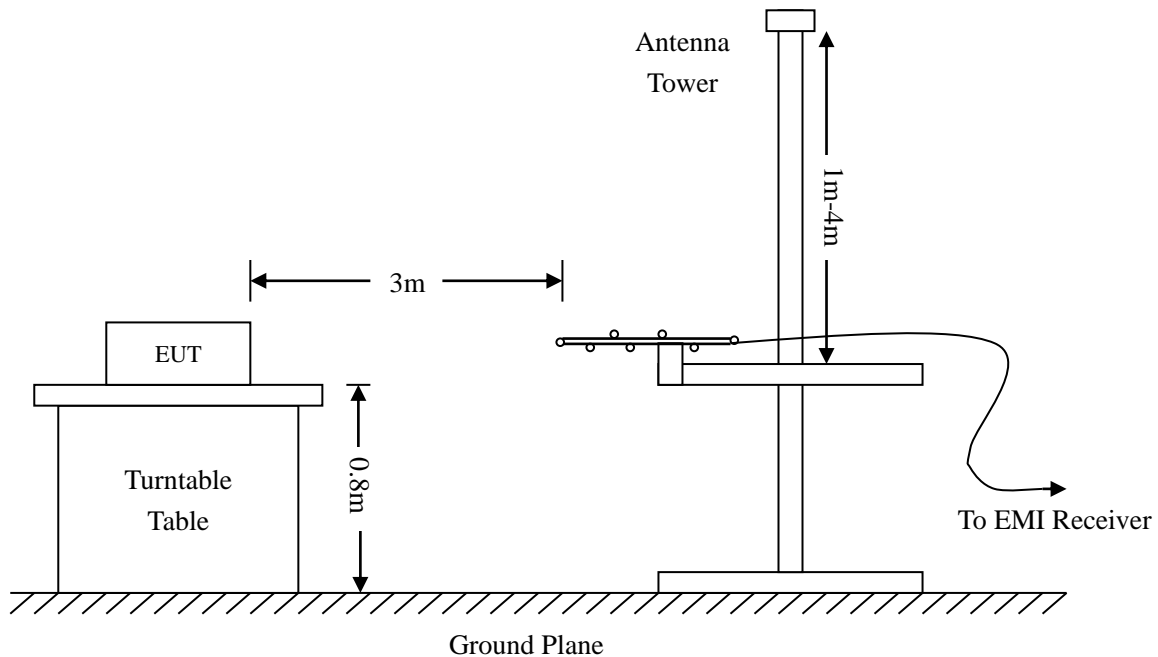
3. Radiated Emissions

3.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 18.305 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



3.2 Test Receiver Setup

Frequency :9kHz-30MHz

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV

3.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of $-6\text{dB}\mu\text{V}$ means the emission is $6\text{dB}\mu\text{V}$ below the maximum limit for Any non-ISM frequency device. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part 18.305 Limit

3.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	54 %
ATM Pressure:	1011 mbar

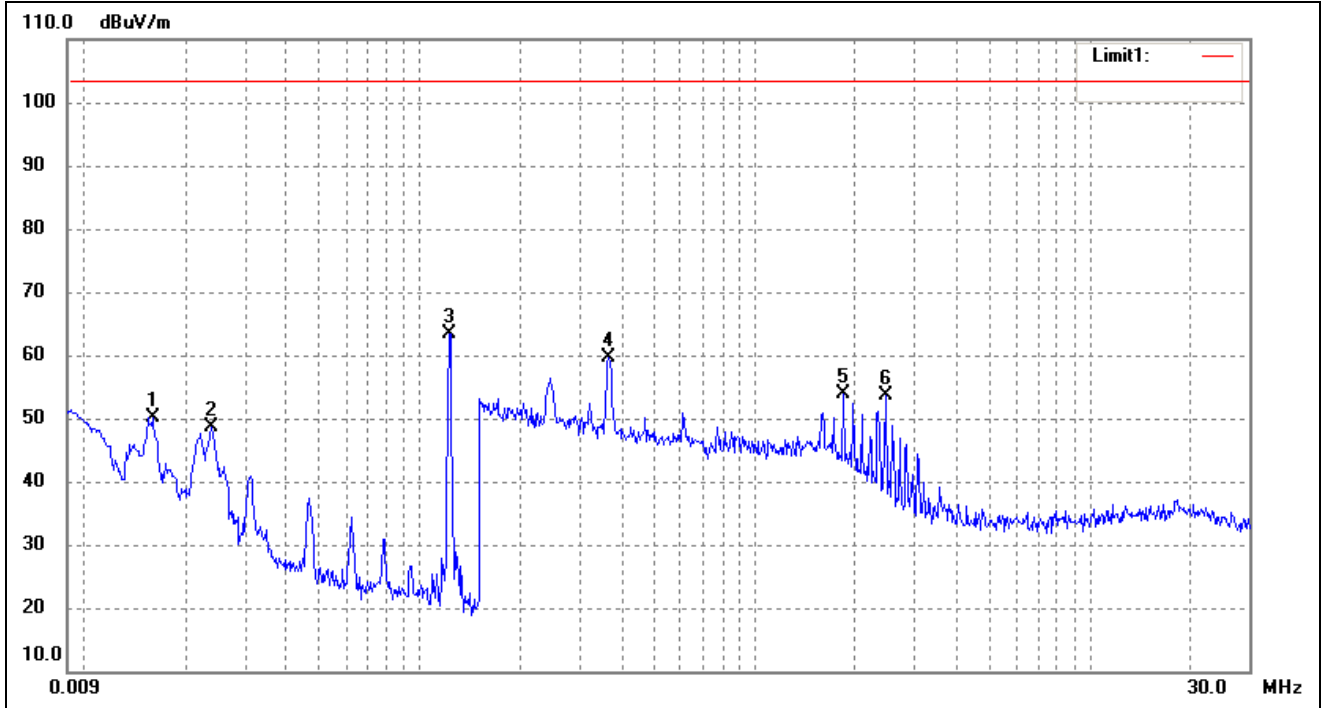
3.5 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC Part 18.305 rule, and had the worst margin of:

-15.27 dB at 293.0842MHz in the Horizontal polarization, 3Meters

Plot of Radiated Emissions Test Data (Below 30MHz)

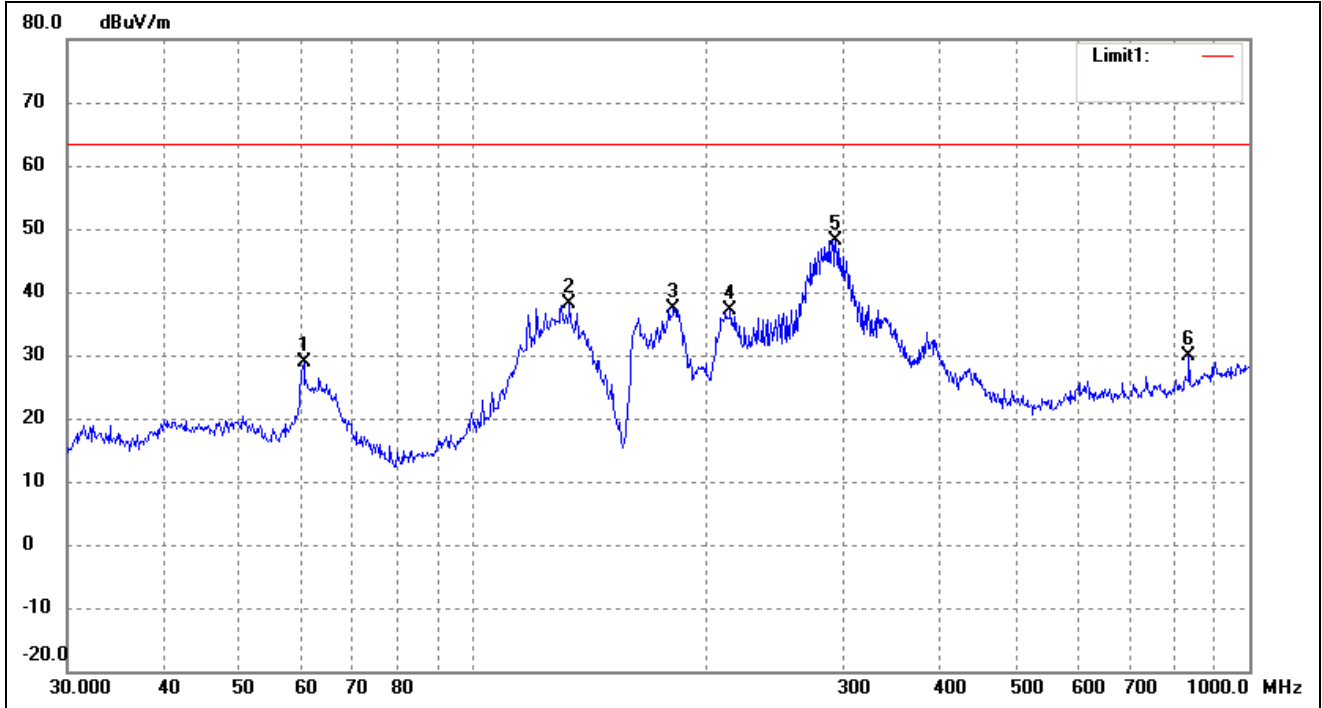
Test mode:	TM1	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	0.0160	55.51	-5.44	50.07	103.50	-53.43	233	100	peak
2	0.0240	54.06	-5.47	48.59	103.50	-54.91	96	100	peak
3	0.1225	68.20	-4.86	63.34	103.50	-40.16	148	100	peak
4	0.3653	65.71	-6.09	59.62	103.50	-43.88	121	100	peak
5	1.8386	62.20	-8.28	53.92	103.50	-49.58	60	100	peak
6	2.4606	53.65	0.00	53.65	103.50	-49.85	253	100	peak

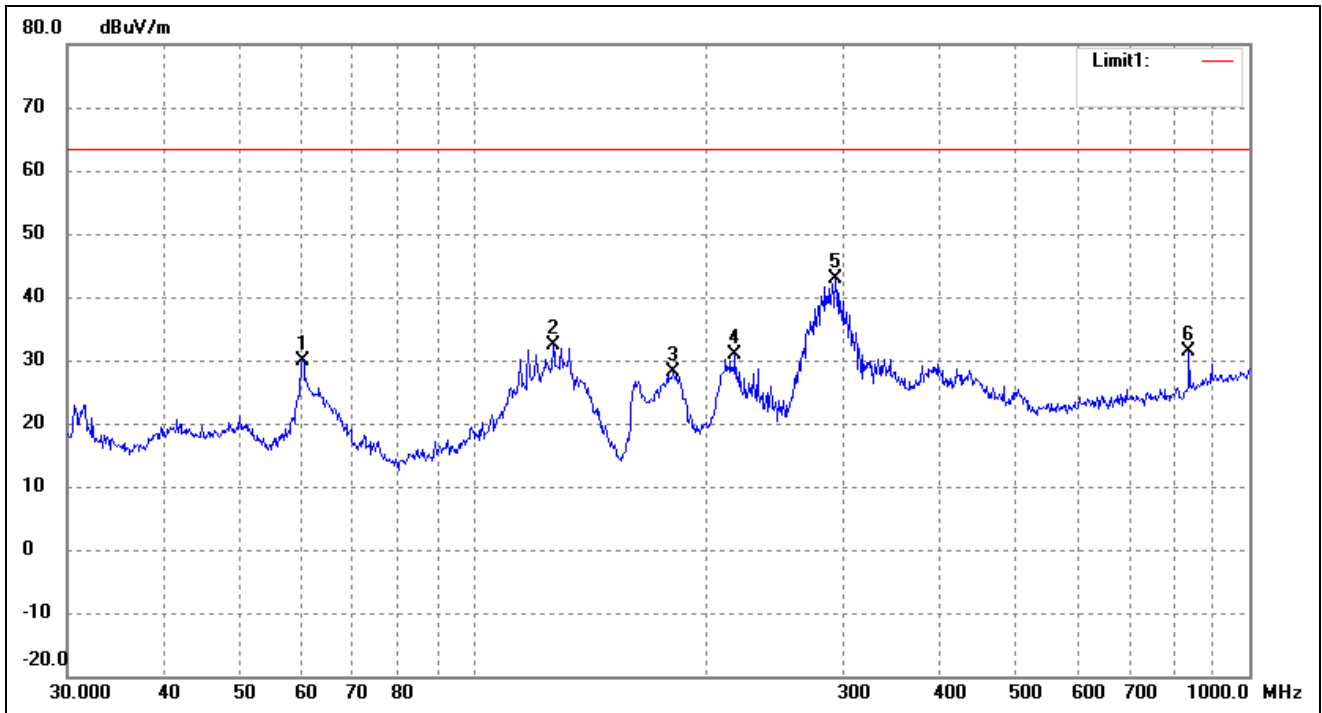
Plot of Radiated Emissions Test Data (Above 30MHz)

Test mode:	TM1	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	60.4919	44.03	-15.24	28.79	63.50	-34.71	81	100	QP
2	133.1511	55.90	-17.89	38.01	63.50	-25.49	191	100	QP
3	181.2834	52.08	-14.66	37.42	63.50	-26.08	97	100	QP
4	214.5143	49.46	-12.31	37.15	63.50	-26.35	272	100	QP
5	293.0842	56.65	-8.42	48.23	63.50	-15.27	195	100	QP
6	836.2443	32.79	-2.88	29.91	63.50	-33.59	141	100	QP

Test mode:	TM1	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	60.2801	45.21	-15.21	30.00	63.50	-33.50	75	100	QP
2	126.7723	49.74	-17.35	32.39	63.50	-31.11	101	100	QP
3	181.2834	42.83	-14.66	28.17	63.50	-35.33	57	100	QP
4	217.5443	43.01	-12.23	30.78	63.50	-32.72	292	100	QP
5	293.0842	51.21	-8.42	42.79	63.50	-20.71	206	100	QP
6	836.2443	34.14	-2.88	31.26	63.50	-32.24	221	100	QP

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